

NIH Blueprint for Neuroscience Research

GENSAT

GENSAT (Gene Expression Nervous System ATlas) is a large-scale project that plans to map the expression of thousands of genes in the developing and adult mouse central nervous system (CNS). The project involves creation of transgenic mouse lines that express a bacterial artificial chromosome (BAC) containing the gene of interest and an enhanced green fluorescent protein (EGFP) reporter to reveal the pattern of gene expression. A prescreen component is included that utilizes traditional radiometric *in situ* hybridization to give a broad picture of CNS gene expression of candidate genes. Both approaches have created gene expression atlases for mouse brain and spinal cord tissue at three developmental stages and in adulthood.

To date, over 600 transgenic BAC-EGFP reporter mice have been generated to allow the exquisite mapping of gene expression at the cellular level and to provide details of cellular morphology. Recently, twelve fully characterized BAC-CRE recombinase driver lines have been created to serve as tools for cell-specific genetic manipulations in select neuronal populations in the brain and spinal cord. Candidate genes are selected by an NIH-assembled advisory committee using bioinformatics approaches, in addition to suggestions solicited from the neuroscience community.

The gene expression data and mouse brain images are available to the public in online, searchable databases (see below). Future GENSAT studies will include the continued generation of new BAC-EGFP and BAC-CRE recombinase transgenic mouse lines, improved mapping of the GENSAT data, and the possible expansion of GENSAT to include analyses of visual, auditory, and pain pathways.

Since the BAC mouse lines are powerful tools for pursuing other types of experiments in identified cells, GENSAT distributes the mouse strains generated for the project via the Mutant Mouse Regional Resource Centers (MMRRCs). More than 200 BAC mouse lines have been placed in the MMRRC repositories since the beginning of the project and are available for a small fee.

Resources:

NCBI GENSAT Database www.ncbi.nlm.nih.gov/projects/gensat

BAC Transgenic Mouse GENSAT Database www.gensat.org/index.html

In Situ Hybridization GENSAT Database www.stjudebgem.org/web/mainPage/mainPage.php

Mutant Mouse Regional Resource Centers www.mmrrc.org

(select major collection: GENSAT)

Submit nominations for gene review and analysis to info@ncbi.nlm.nih.gov.

Contacts:

For general inquiries:

Laura Mamounas, Ph.D.

Program Director and GENSAT Project Officer

National Institute of Neurological Disorders and Stroke (NINDS)

mamounal@ninds.nih.gov

(301) 496-5745

Edmund Talley, Ph.D.

Program Director

National Institute of Neurological Disorders and Stroke (NINDS)

talleye@ninds.nih.gov

(301) 496-1917

For general and gene selection inquiries:

Amelie K. Gubitza, Ph.D.

Program Analyst

National Institute of Neurological Disorders

and Stroke (NINDS)

gubitza@ninds.nih.gov

(301) 496-5745

GENSAT is a contract funded by the Institutes and Centers that comprise the NIH Blueprint for Neuroscience Research.

The **Mutant Mouse Regional Resource Centers** contract is supported by the National Center for Research Resources at www.ncrr.nih.gov with additional funding from the other Institutes and Centers that comprise the NIH Blueprint for Neuroscience Research.

October 2007



U.S. Department of Health
and Human Services
National Institutes of Health